

INCH-POUND

MIL-PRF-1/1225E
2 July 2004
SUPERSEDING
MIL-PRF-1/1225D
2 July 1999

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING
TYPE 6688

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the electron tube described herein shall consist of this document and the latest issue of MIL-PRF-1.

DESCRIPTION: Pentode, miniature, rf, sharp cutoff.
Outline --- 6-1 (EIA)
Base --- E9-1
Envelope --- T6-1/2
Cathode --- Coated unipotential

Base connections:

Pin No.	1	2	3	4	5	6	7	8	9
Element	k	g1	k	h	h	int con	a	g3	g2

ABSOLUTE RATINGS:

Parameter:	Ef	Eb	Ec1	Ec2	Ec3	Ehk	ec1
Unit:	V	V dc	V dc	V dc	V dc	v	v
Maximum:	6.6	210	0	175	0	60	---
Minimum:	6.0	---	-50	---	---	---	-100
Test conditions:	6.3	190	+9	160	0	0	---

ABSOLUTE RATINGS:

Parameter:	Rk	Rg1	Ik	Pp	Pg2	TE	Alt
Unit:	Ohms	MegΩ	mA dc	W	W	°C	ft
Maximum:	---	0.1	25	2.7	0.6	+155	1/
Minimum:	---	---	---	---	---	---	---
Test conditions:	630	---	---	---	---	---	---

See footnotes at end of table I.

GENERAL: Qualification - Required.

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TABLE I. Testing and inspection.

Inspection	Method MIL-STD- 1311	Conditions	Acceptance Level 11/	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 1</u>							
Heater current	1301		0.4	I _f	285	315	mA
Heater-cathode leakage	1336		0.4	I _{hk}	---	15	μA dc
Total grid current	1266	2/	0.4	I _{c1}	0	-0.5	μA dc
Anode current (1)	1256	E _{bb} = 180 V dc; E _{cc1} = 0; E _{cc2} = 150 V dc; E _{cc3} = 0; R _k = 78 ohms 2/	0.4	I _b	8.0	18.0	mA dc
Anode current (2)	1256	E _{c1} = -6.0 V dc; E _{bb} = 180 V dc; E _{cc2} = 150 V dc; E _{cc3} = 0; R _k = 78 ohms	0.4	I _b	---	100	μA dc
Screen-grid current	1256		0.4	I _{c2}	2.9	3.7	mA dc
Transconductance (1)	1306		0.4	S _m	14,200	18,800	μmhos
Short and discontinuity detection	1201		0.4	---	---	---	---
<u>Conformance inspection, part 2</u>							
Insulation of electrodes	1211		2.5	R	20	---	MegΩ
Transconductance (2)	1306	E _f = 5.7 V	2.5	$\frac{\Delta S_m}{E_f}$	---	15	%
Grid emission	1266	E _f = 7.5 V; E _{c1} = -6.0 V dc; R _k = 0 3/	2.5	I _{c1}	0	-0.5	μA dc
Noise and microphonics	2201	E _f = 6.3 V; E _{hk} = 0; E _{bb} = E _{cc2} = 200 V dc; E _{c1} = 0; E _{cal} = 600 mV ac; R _k = 1,000 ohms; R _p = 0.1 MegΩ; R _{g2} = 0.5 MegΩ; C _{g2} = 2 μF 4/	2.5	---	---	---	---
Direct-interelectrode capacitance	1331	Shield No. 315 5/	6.5	C _{g1p} C _{in} C _{out}	---	0.030	pF
					6.7	8.5	pF
					2.50	3.50	pF
Low-frequency vibration	1031	R _p = 2,000 ohms	6.5	E _p	---	300	mV dc
Shock	1041	450 G; E _{hk} = +100 V dc 7/	---	---	---	---	---
Vibration fatigue	1031	2.5 G; F = 25 min, 60 max; fixed frequency	6.5	---	---	---	---

See footnotes at end of table.

TABLE I. Testing and inspection - Continued.

Inspection	Method MIL-STD- 1311	Conditions	Acceptance Level <u>11/</u>	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 2 - Continued</u>							
Post-shock and vibration fatigue end points	---						
Low-frequency vibration	1031		---	Ep	---	400	mV ac
Heater-cathode leakage	1336		---	lhk	---	30	μ A dc
Transconductance (1)	1306		---	Sm	12,500	---	μ mhos
Total grid current	1266		---	lc1	0	-1.0	μ A dc
Base strain	1121		---	---	---	---	---
Glass strain	2126		6.5	---	---	---	---
Permanence of marking	1105		---	---	---	---	---
<u>Conformance inspection, part 3</u>							
Heater-cycling life	1506	Ef = 7.5 V; Ehk = 60 V dc; Eb = Ec1 = Ec2 = 0	---	---	---	---	---
Life-test end points (heater-cycling)	---						
Heater-cathode leakage	1336		---	lhk	---	30	μ A dc
Stability life	1516	Eb = 200 V dc; Ec1 = +9 V dc; Ec2 = 170 V dc; Ec3 = 0; Rk = 680 ohms; Rg1 = 0.5 Meg Ω ; TA = room temperature	---	---	---	---	---
Life test end point (stability)	---						
Change in transconduc- tance (1) of individual tubes	1306		---	$\frac{\Delta Sm}{t}$	---	10	%
Intermittent life	1501	Stability life-test conditions; TE = +155°C (min) <u>8/ 9/</u>	---	---	---	---	---

See footnotes at end of table.

TABLE I. Testing and inspection - Continued.

Inspection	Method MIL-STD-1311	Conditions	Acceptance Level <u>11/</u>	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 3</u> - Continued							
Life-test end points (intermittent) (500 hours)	---						
Inoperatives	---		---	---	---	---	---
Total grid current	1266		---	Ic1	0	-0.9	μA dc
Heater current	1301		---	If	285	315	mA
Change in transconductance (1) of individual tubes	1306		---	$\frac{\Delta S_m}{t}$	---	20	%
Transconductance (2)	1306		---	$\frac{\Delta S_m}{E_f}$	---	15	%
Heater-cathode leakage	1336		---	Ihk	---	30	μA dc
Insulation of electrodes	1211		---	R	10	---	MegΩ
Transconductance (1) average change	1306		---	Avg $\frac{\Delta S_m}{t}$	---	15	%
Total defectives	---		---	---	---	---	---
Life-test end points (Intermittent) (1,000 hours)	---						
Inoperatives	---		---	---	---	---	---
Total grid current	1266		---	Ic1	0	-0.9	μA dc
Heater current	1301		---	If	285	315	mA
Change in transconductance (1) of individual tubes	1306		---	$\frac{\Delta S_m}{t}$	---	25	%
Heater-cathode leakage	1336		---	Ihk	---	30	μA dc
Insulation of electrodes	1211		---	R	10	---	MegΩ
Total defectives	---		---	---	---	---	---

- 1/ See "Reduced pressure (altitude) rating", and altitude, maximum peak voltage.
- 2/ This test to be performed at the conclusion of the holding period.
- 3/ Prior to this test, tubes shall be preheated a minimum of 5 minutes at the conditions indicated below. The 3-minute test is not permitted. Test at specified conditions within 3 seconds after preheating. Grid emission shall be the last test performed on the sample selected for the grid-emission test.

Ef	Ec1	Ec2	Eb	Rk
V dc	V dc	V dc	V dc	Ohms
7.5	+9	160	190	630

- 4/ The rejection level shall be set at the VU meter reading obtained during calibration.
- 5/ Pin 6 floating.

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TABLE I. Testing and inspection - Continued.

- 6/ This test shall be conducted on the initial lot and thereafter on a lot approximately every 12-months. In the event of lot failure, the lot shall be rejected and the succeeding lots shall be subjected to this test until a lot passes. When one lot has passed, the 12-month rule shall apply. Sample size of 13, shall apply.
- 7/ A grid resistor of 0.1 megohm \pm 10% shall be added; however, this resistor will not be used when a thyratron-type short indicator is employed.
- 8/ Envelope temperature (TE) requirements, when measured in accordance with the temperature by conduction-band measurement (MIL-STD-1311 method 1226), will be satisfied if a tube having bogey lb (\pm 5 percent) under normal test conditions, is determined to operate at or above minimum specified temperature at any position in the life-test rack.
- 9/ The life-test sample shall consist of 20 tubes per lot and not 1 tube failure shall be permitted. In the event of rejection of the first sample, due to failure of 1 tube or more, a second sample of 40 tubes shall be selected from the lot, and not 1 tube failure from the second sample of tubes shall be permitted.
- 10/ Revision letters are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.
- 11/ This specification sheet uses accept on zero defect sampling in accordance with MIL-PRF-1, table III.

NOTES

Referenced documents. In addition to MIL-PRF-1, this specification sheet sheet references MIL-STD-1311.

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue.

Custodians:

Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5960-3724)

Review activities:

Army - AR, CR4, MI
Navy - AS, CG, MC, OS
Air Force - 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at www.dodssp.daps.mil.